

What is claimed is:

1. A method for trading electrical transmission rights, the method comprising:
receiving offers to buy and sell point-to-point transmission rights on a network from market participants;
calculating quantity exchange rates between pairs of offers to buy and sell transmission rights for subsequent representation to other market participants to and from their defined locations on the network, the quantity exchange rates being calculated on a basis of the ratios of their impact on binding transmission constraints, such that substantially all binding constraints on the network can be satisfied when trading occurs; and
matching trades to buy and sell transmission rights based on the offers to buy and sell transmission rights submitted by market participants that are currently valid on the system.
2. A method as set forth in claim 1, wherein, in the step of calculating, the ratios of impact on binding transmission constraints are defined by a power transfer distribution function (PTDF) in functional or matrix form.
3. A method as set forth in claim 1, wherein, in the step of calculating, when multiple transmission constraints are simultaneously binding on the network, the quantity exchange rates can be established by:
determining, using a PTDF or trading matrix, impact of a trade between each pair of offers to buy and sell on each of the potentially binding constraints; and
ensuring that under each possible trade the transmission constraints can continue to be met when a trade is carried out.
4. A method as set forth in claim 3, wherein the step of determining includes
updating the PTDF or trading matrix, during trading, to reflect changes in the state of the network or other contingencies; and
creating a new PTDF or trading matrix for use in calculating exchange rates between transmission rights for possible and actual trades.

5. A method as set forth in claim 3, wherein the PTDF or trading matrix is non-constant or non-linear, such that constraints on transmission can be determined on individual network elements in view of existing scheduled trades or loadings or estimated from state information.

6. A method as set forth in claim 5, wherein constraints on transmission is determined based on a database of existing trades.

7. A method as set forth in claim 5, further including:
evaluating the PTDF, using as parameters, values of line loadings and state information;
obtaining a marginal PTDF matrix or function at various line loadings in view of possible trades; and
calculating an exchange rate between possible trades on the network using the marginal PTDF matrix or function.

8. A method as set forth in claim 1, further comprising representing the offers to buy and sell transmission rights made by each participant to other participants, the representing offers including prices and quantities adjusted based on the calculated exchange rates.

9. A method as set forth in claim 1, wherein in the step of matching, the matching of trades to buy and sell transmission rights is based on the adjusted quantities and prices of transmission rights.

10. A method as set forth in claim 1, wherein the step of matching includes processing orders to buy and sell transmission rights submitted from the participants, which orders are in response to the offers made by other participants.

11. A method as set forth in claim 1, further including recording trades made.

12. A method as set forth in claim 11, wherein the step of recording includes updating set of rights held by each market participant and the trades made for settlement purposes.

13. A method as set forth in claim 1, further including limiting trades in transmission rights to at least one right, rather than providing a portfolio of rights, so as to permit electrical transmission to be transferred from a location to or from a defined hub or node.

14. A method as set forth in claim 1, further including accounting for new transmission constraints, in response to an introduction of new transmission constraints that reflect changes in the transmission systems or other contingencies, in a set of existing constraints used in calculating the exchange rates between offers to buy and sell transmission rights.

15. A method for simultaneously trading transmission rights and energy on a network, the method comprising:

receiving, from market participants, offers to buy and sell point-to-point transmission rights on the network and blocks of energy at a trading hub or other point on the network;

calculating quantity exchange rates between offers to buy and sell transmission rights and corresponding offers to buy and sell blocks of energy for subsequent representation to other market participants to and from their defined locations on the network, the quantity exchange rates being calculated on a basis of ratios of their impact on binding transmission constraints, such that substantially all binding constraints on the network can be satisfied when trading occurs;

determining a potential cost of acquiring incremental transmission rights for supplying energy at a participant's location and having the energy delivered to the hub or other points on the network, and a potential cost of acquiring incremental transmission rights for purchasing energy at the hub and having the energy delivered to a location;

providing an effective price to be paid for additional energy generated at a location and an effective price to be paid for additional energy received at another location; and

matching trades to buy and sell transmission rights and blocks of energy based on the offers to buy and sell transmission rights and blocks of energy submitted by market participants currently valid on the network.

16. A method as set forth in claim 15, wherein, in the step of calculating, the ratios of impact on binding transmission constraints are defined by a power transfer distribution function in functional or matrix form.

17. A method as set forth in claim 15, wherein the step of calculating includes computing, from the offers to buy energy at the hub, a demand schedule.

18. A method as set forth in claim 15, wherein the step of calculating includes computing, from the offers to sell energy at the hub, a supply schedule.

19. A method as set forth in claim 15, wherein, in the step of determining, the effective price to be paid for additional energy generated includes, offers to purchase energy at the hub, and the incremental costs of acquiring transmission rights for delivery of energy to the hub from a defined location.

20. A method as set forth in claim 15, wherein, in the step of determining, the effective price to be paid for additional energy received includes offers to supply energy at the hub and the incremental costs of acquiring transmission rights for delivery of energy to the hub from a defined location.

21. A method as set forth in claim 15, wherein, in the step of determining, the cost of acquiring incremental transmission rights to the hub from a participant's location for the purpose of calculating the effective price to be paid for additional energy supplied includes the cost of acquiring transmission rights from other participants at prevailing prices.

22. A method as set forth in claim 15, wherein, in the step of determining, the cost of acquiring incremental transmission rights to the hub from a participant's location for the purpose of calculating the effective price to be paid for additional energy supplied is zero if all of the needed rights for additional sales of energy were already held by that participants and were not used for other sales or purchase transactions.

23. A method as set forth in claim 15, wherein, in the step of determining, the cost of acquiring incremental transmission rights from the hub to a participant's location for the purpose of calculating the effective price to be paid for additional energy purchased includes the cost of acquiring transmission rights from other participants at prevailing prices.

24. A method as set forth in claim 15, wherein, in the step of determining, the cost of acquiring incremental transmission rights from the hub to a participant's location for the purpose of calculating the effective price to be paid for additional energy purchased is zero if all of the needed rights for additional purchases of energy were already held by the participants and were not used for other sales or purchase transactions.

25. A method as set forth in claim 15, wherein the step of determining includes assessing a potential for generating a counterflow on a constrained or potentially constrained transmission line on the network.

26. A method as set forth in claim 25, wherein the potential for generating a counterflow can be determined from a PTDF matrix and a set of binding transmission constraints.

27. A method as set forth in claim 25, wherein the step of determining further includes providing a participant generating a counterflow with additional rights on a constrained or potentially constrained transmission line on the network.

28. A method as set forth in claim 25, wherein the step of determining further includes subtracting a value of the counterflow from the cost of acquiring incremental rights for the purpose of calculating the effective price of energy at a location.

29. A method as set forth in claim 15, wherein, in the step of matching, the matching of trades to buy and sell transmission rights and blocks of energy is based on the adjusted quantities and prices of transmission rights and blocks of energy.

30. A method as set forth in claim 15, wherein the step of matching includes processing orders to buy and sell transmission rights and blocks of energy submitted from the participants, which orders are in response to the offers made by other participants.

31. A method as set forth in claim 15, further comprising representing the offers to buy and sell transmission rights and blocks of energy made by each participant to other participants, the representing offers including prices and quantities adjusted based on the calculated exchange rates.

32. A method as set forth in claim 15, further including recording trades made.

33. A method as set forth in claim 32, wherein the step of recording includes updating set of rights held by each market participant and the trades made for settlement purposes.

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